

the theory that the Aurora is "an electrical phenomenon arising from the positive electricity of the atmosphere developed by the rapid condensation of the vapours in the act of freezing;" and a most valuable paper was contributed by him to the seventh edition of Riddle's *Navigation* on "Circular Arc Sailing," a highly practical and instructive attempt to modify great Circle Sailing when the latitude into which the ship would be led is so high as to render navigation dangerous. His great age and increasing infirmity prevented Mr. Fisher during the last few years of his life from taking part in the meetings of the Society; yet till the very day before his death he never failed to take a lively interest in its transactions, and the progress of Astronomical Science had an increasing source of delight to him.

Always of a singularly childlike and contented disposition, the companionship of those dearest to him, and of his books, were all he needed for happiness; and after eleven years' tranquil enjoyment of well-earned rest, he passed gently and painlessly away on the 14th of May, 1873, loved by all who knew him throughout the course of his blameless life of nearly eighty years.

A. F.

WILLIAM MANN, late First Assistant at the Royal Observatory, Cape of Good Hope, and attached to the staff of that Observatory during a period of thirty-two years, was the third son of Major-General Cornelius Mann, of the Royal Engineers. He was born at Lewisham, in Kent, October 25, 1817, and died at Claremont, near Cape Town, on the 30th of April, 1873, at the age of fifty-five years. He was elected a Fellow of this Society on the 10th of March, 1871.

The subject of this memoir was under the care of private tutors in England until 1830, when he was in the thirteenth year of his age. At that time his father received the appointment of Commanding Royal Engineer at Gibraltar, and he went with his family to that station, and continued his studies there, in the hope of entering in due time the Royal Military Academy, at Woolwich. The regulations, however, prevented this, in consequence of his having an elder brother already in the Academy. He accordingly had to turn his attention to some other pursuit; and through the kind recommendation of Admiral Shirreff was ultimately appointed Second Assistant at the Royal Observatory, at the Cape. He visited England to complete his preparations for the appointment in 1837, and joined the staff of the Royal Observatory in October 1839, being then twenty-two years old.

Mr. Mann took with him to the Cape various instruments and forms of apparatus that had been prepared for re-measuring La Caille's Arc of the Meridian. During the first six years of his service he was chiefly employed in operations connected with this work, under Mr. (now Sir Thomas) Maclear; and it was while so employed that his sterling value as a votary of science became apparent. He had great fondness for the higher branches

of the mathematics, and great facility in applying their doctrines and methods, and with this natural aptitude he possessed also a remarkable skill in mechanical manipulations. In addition to these natural gifts he was persevering and patient to the last degree, and fastidiously scrupulous in the performance of all tasks of duty. While working upon the verification and extension of La Caille's Arc he was often exposed for months at a time in the wild country of the Clanwilliam District, lying between 200 and 300 miles north of the Cape, occasionally being three months without other shelter at night than the open sky. The kind of life he had to lead at this time is very graphically told in a brief extract from one of his letters, in which he describes how he established the station some seventy miles beyond the Sneeuw Kop peak of the Cedar Mountains. A mountain had been seen over the broken Karroo country from the Sneeuw Kop, in a north-eastern direction, which seemed likely to answer for a connected station; but the intervening tract of land was so difficult, and the means of transport so utterly insufficient, that it was out of all question to attempt to send a party of men to the place to establish the signal. Mr. Mann, therefore, volunteered to make his way to the mountain, and to conduct the signals by himself. He accordingly started, with only one Hottentot attendant, a bag of rusks, and a map of the country. After three days' wandering through the wildest and most desolate territory, entirely destitute of water, he came providentially upon a small stream, late one evening, and slept on a bare rock near the base of the desired mountain. His narrative of his further proceedings is then continued in the following words: "Next morning I called a council of war, consisting of myself, to debate on what was to be done. I found there was bamboo enough to last the horses two days, and we two mortals might possibly exist that period upon the quantity of bread which remained; and as the time was precious in our operations, and if I left our present position I did not know how long we might be wandering about before we came to a house, I determined to make this my head-quarters. So leaving my servant in charge of the horses, I prepared to ascend the mountain for the purpose of making the necessary signals. I took with me two rusks, all that could be spared, and which were to last me as many days, and as much water as my pocket-pistol could hold, which was about one draught. I had about 2,000 feet of mountain to climb, and a heavy load to carry; and taking into account the heat of the weather, and the want of a breakfast, I was *rather* tired when I at last arrived at the top. I soon established my signal, and sat all the rest of the day reading it. I was obliged to fill my mouth with pebbles to keep it moist. Night came on, and, hungry and thirsty, I laid myself down to sleep. There was not a stone or a bush on the top to afford the least shelter; it blew a gale of wind, and the night was as cold as the day had been hot. Next morning at sunrise I was again signalling away, and

L

about noon to my great joy I saw the signal from the Sneeuw Kop station for me to leave! I was not long in packing up my traps and getting down the mountain. I found my servant and the horses looking very miserable, but cheered the former with the news that I had discovered with my telescope a farm-house a few hours off." He then goes on to tell how he made for the house, but alas! only to find it a ruined and deserted homestead. He finally reached the Sneeuw Kop Station, after three other days of painful travel. This little incident is worthy of extract, as illustrating in a forcible way what measuring an arc of meridian in the wilds of South Africa means. It is not surprising that even a naturally vigorous and good constitution felt the strain of such work and exposure as this. In the year 1846 Mr. Mann had to visit England for the restoration of his impaired health; and Mr. Maclear wrote upon that occasion: "I feel the loss of Mr. Mann's services especially at the present juncture. His powerful intellect, his unflinching integrity and industry, enable me to trust him with confidence on all occasions and in every department, whether at the Observatory or on the Triangulation, being certain that whatever is practicable he will accomplish, and that what he does will be sure to be well done."

Mr. Mann returned to the Cape in improved health in 1847, and for the next five years was actively and incessantly engaged in the current work, both of observing and calculating, in the Observatory. In 1852 he was commissioned to proceed to England, to make himself acquainted with the mechanism of the large Transit Circle then constructing for the Cape. He returned to the Cape with this instrument in his charge, and then proceeded to erect it at the Observatory, a work of hardly conceivable difficulty under the circumstances, as at that time there was absolutely no skilled labour, of the class required, at the Cape. If Mr. Mann had not been unusually skilful himself in the use of his hands and in the delicate application of tools, as well as familiar with every essential point in the mounting of the complicated instrument, the work would have had to stand over until artisans could be sent from England at very large cost. As it was, the noble Transit Circle, which is very nearly a duplicate of that in use at Greenwich, was mounted in a most complete and efficient manner. The writer of these lines remembers an interesting and notable illustration of the accuracy and skill with which this difficult task was performed, which he had from Mr. Mann himself in familiar conversation. In one part of the operations the exactness of the position had to be determined by the image of a central wire being reflected from a still surface of mercury. Mr. Mann, having had the pivots of the horizontal axis placed rudely in position on the piers, was aghast to find that he had no image of the wire in the field of view. After some puzzle and some delay, to his inexpressible delight he found on tapping the tube that the reflected image was there, but concealed behind the wire. The work had been so perfectly planned

and executed, and the instrument was so absolutely in place, that the wire intercepted its own reflected image. Mr. Mann had no other assistance in the erection of this large instrument than such as he could get from Hottentot workmen trained by himself.

About the year 1853 Mr. Mann married Caroline, the second daughter of Mr. Maclear, Her Majesty's Astronomer at the Cape, and so, as a member of the family of his chief, became more closely interested in, and more intimately identified with, the Cape establishment.

At the latter part of the year 1859 Mr. Maclear paid a visit to England, and during his nine months of absence, the entire administration of the affairs of the Royal Observatory at the Cape was placed in Mr. Mann's hands. During that period he undertook the calculations that still remained necessary for completing the verification and extension of La Caille's arc of the meridian. These calculations were ultimately carried through by Mr. Mann himself. About this time he also entered very assiduously into comet-work, which always had great attraction for him; and it was during the long exposures to cold winter nights incident upon this, and especially while observing Encke's Comet, that he incurred the first attack of a disorder of the chest, under which he has since fallen. In 1866 he made a short visit to Natal, on account of the severe suffering that asthmatic disorder had brought upon him, and in 1867 extended his trip to England for a further measure of rest and change. After six months' recruiting he returned to his work, considerably refreshed, and then entered upon the reduction of the Cape observations for the preceding thirty-four years. He also continued his comet-work, and conceived an organised plan for the observation, reduction, and cataloguing of Southern stars, which unfortunately he was never able to carry through. Up to the year 1870, although unmistakably suffering from impaired powers, he was unintermitting in his application to the work of the Observatory. At this time he had to meet the additional depression and vexation incident to the retirement of Sir Thomas Maclear from his position as Astronomer Royal at the Cape. Not long subsequently to this an outbreak of scarlet fever occurred in the neighbourhood of the Cape, and visited the Royal Observatory. Two of Mr. Mann's children died of the disease, and he himself suffered so severely that his life was for some time in jeopardy. Under the great care of his family and friends he survived the actual attack, but was so broken down by it that he found it impossible to resume his work, and resigned his appointment, retiring with a small pension for his past services. At the end of the year 1872 he was further reduced by bronchial disease, and from that time, with occasional fluctuations, gradually declined, until the last day of April in the following year, when he sank quietly to his rest, after a useful life of hard labour, leaving a widow and a large family of children to mourn his loss. Shortly before his death Her Majesty had



been pleased to grant him a small pension from the Civil List in recognition of his good service, but he was himself never aware of this gracious act. Mr. Gladstone very considerably ordered the payment of a sum equal to three years of this pension to Mrs. Mann.

Apart from the pursuits involved in his professional work and in his high mathematical and mechanical attainments, Mr. Mann had great fondness for archæological studies. He had a considerable knowledge of old coins, which he had studied in early life with his father. He had also some skill as an artist, and sketched from nature. The qualities, however, which will be most closely associated with his memory by his acquaintances and friends are the singular combination of gentleness and strength, of modesty and power, which were present in all he did. There never was a man who moved through a thorny path in life, in which the growing needs of a large family had to be provided for out of too limited and inelastic means, with more patient and resolute courage. It was only the few who had the privilege of his intimate acquaintance who were aware of the remarkable intellectual vigour and strength, the clear and exact thought, and the large sympathies and attainments that lay behind the sweet ever-present smile, the gentle word, and the all but absolute forgetfulness of self, which at all times made up his personal presence, and gave as it were the key-note of his character. William Mann, of the Cape Observatory, had not the pushing, self-asserting qualities which most win the admiration of the world, and which most certainly command its substantial rewards. But he had the capacity and powers which would have given him a much more distinguished position than he attained if he had been more favoured by circumstances. As it is, he has the reward of a full recognition of honest work, ably performed through a long self-denying life, and the sorrowing memories of a small circle of appreciative friends, some among whom delight also in the consciousness that simple, unaffected, and unquestioning piety went hand-in-hand in his daily life with his remarkable intellectual aspiration and mental power.

R. J. MANN M.D.

JOHN ROBINSON M'CLEAN was born at Belfast, in 1813. After the completion of his general education he applied himself assiduously to the task of preparing for the profession which he had chosen, that of a civil engineer. With this view he proceeded to the University of Glasgow, and after studying there with distinction he entered the office of Messrs. Walker and Burgess, where he continued for seven years.

In the year 1844 Mr. M'CLean began to practise independently, and from that time rapidly rose to eminence in his profession. As an engineer he was distinguished for practical skill and sound judgment, and his name is associated with numerous important works designed and carried to a successful issue by him, and many of which owed their origin to his wise foresight. The now important